# BOOK REVIEW

**Brain Messengers and the Pituitary. By Eugenio E. Müller and Giuseppe Nisticò. 1989. Academic Press, Orlando, FL. 711 p. $149.00 hardcover.**

This book is a comprehensive review of basic and clinical research on neuropeptides and neurotransmitters and their control of the anterior pituitary gland. Müller and Nisticò's monograph details the progress in neuroendocrinology over the past decade. Beyond reviewing a compilation of data, they set as one of their primary objectives to include, "information to give the readers an appreciation of the significance of the advances in the field." This has been successfully accomplished.

Specifically, *Brain Messengers and the Pituitary* considers the principle biochemical and electrophysiological mechanisms underlying the complexity of interneuronal communication and focuses on selected drugs that affect neuroendocrine function. The authors review the experimental evidence for CNS control of the pituitary via hypophysiotropic regulatory hormones. Furthermore, they report studies on the "chemical isolation, identification and synthesis, pituitary effects, extraendocrine actions and therapeutic uses of classical hypophysiotropic hormones, with special emphasis on CRF and GHRH." The authors also survey the neuroendocrine effects of a number of neuropeptides, such as Substance P and neurotensin, "whose physiological role in control of pituitary function awaits clarification." Müller and Nisticò have also included chapters dealing with the anterior pituitary as a target of CNS-derived and peripheral hormonal influences, neurotransmitter regulation of the anterior pituitary gland and neurotransmitter-neuropeptide involvement in neuroendocrine disorders.

A common physiological theme that is examined throughout the book is the role of the receptor in proposed neuroendocrine mechanisms. For example, one can find the principle characteristics of pituitary receptors for neuropeptides and neurotransmitters reviewed, as well as a discussion of subtypes of receptors for each neurotransmitter. Another aspect which is widely reviewed by the authors is the evidence linking brain neurotransmitters to the secretion of hypothalamic hormones and, therefore, to anterior pituitary hormones or to neuroendocrine feedback regulation. A natural consequence drawn from that discussion is their examination of the evidence for neurotransmitter-neuropeptide dysfunction as an etiology for specific neuroendocrine disorders such as growth hormone deficiency states and Cushing's disease.

*Brain Messengers and the Pituitary* is well-integrated and organized and represents a balance between clinical and basic research. Müller and Nisticò have used an earlier monograph, *Neurotransmitters and Anterior Pituitary Function,* published in 1977 as a basis for this work. They have effectively reviewed and organized the massive body of neuroendocrine research that has accumulated since the publication of their first book. *Brain Messengers and the Pituitary* is an extensive work which contains more than 4000 references and over 70 tables. This book is written for students, researchers and clinicians in the fields of neuroendocrinology, neurobiology, neuropharmacology, neurophysiology and psychiatry.

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# BOOK REVIEW

**From Quarks to the Cosmos: Tools of Discovery. By Leon M. Lederman and David N. Schramm. 1989. W. H. Freeman & Co., New York, NY. 242 p. $24.95 hardcover.**

Precisely at 7:35 A.M. Greenwich mean time, February 23, 1987, detectors in Cleveland, Ohio and Tokyo, Japan simultaneously recorded unusual bursts of neutrino "events". A few hours later, at the Inter-American Observatory in Cerro Tololo, Chile, a Canadian Astronomer named Ian Shelton discovered the source of the neutrino bursts — a supernova — in a picture of the sky he had just taken.

That same night, Shelton saw with his "naked eye" the newly exploding star near the Tarantula Nebula in the Large Cloud of Magellan. His discovery was designated SN1987A, meaning it was the first supernova discovered in the year 1987. The story of SN1987A and its detection by neutrinos is one of the latest examples of the synergy of two very different disciplines — astronomy and particle physics — and their convergence in modern times.

The total of 19 neutrinos that were detected in Cleveland and Tokyo that night arrived at very nearly the same time as the light from the supernova. Both had travelled for tens of thousands of years to arrive at Earth together, so the neutrinos had to have travelled at the speed of light or very near it. To particle physicists, this meant the neutrino's mass, very difficult to measure in any other way, had to be very nearly zero. The number of neutrinos, their energies, and the distribution in the times of their arrival, gave astronomers important new information about the nature of the otherwise hidden nuclear explosion in the core of the star. The information each discipline's instruments supplied to the other was purely serendipitous, since the instruments were being used for completely different scientific "missions"; in each case, however, the new information could have been obtained in no other easily conceived way.

The frontiers of modern physical science lie at opposite ends of the spectrum of sizes of things — the subnuclear domain and the cosmic domain. Particle physicists, who investigate the ultimate microscopic realm, use almost pretentious phrases like "theory of everything" and "Grand Unification Theory" to describe their works. Equally "grand" are the questions of the origin, future and ultimate structure of the universe studied by modern astronomy, astrophysics and cosmology. The study of SN1987A illustrates some of the connections between these two ends of the size spectrum that, between them, supply the answers to the most basic questions science knows how to ask. The relationship is old. The roots of modern atomic physics lie in 17th-century discoveries by telescope makers, Galileo, Kepler and Newton. The 19th-century understanding of electromagnetic fields led in the same century to spectroscopy, which remains the most productive scientific technique astronomers use today. In the early 20th-century, astrometry provided the key tests of Einstein's relativity theories, and the periodic table of elements was enhanced by the spectroscopic discovery of helium in the sun. Neutron stars were first postulated based on the knowledge from nuclear physics. Cosmic rays were the earliest high-energy particles available to the particle physicist. Hans Bethe, in the 1930s, found that nuclear physics was the key to understanding the stars. Should black holes in outer space someday become a proven reality, their origins will be traced to the physics of the early 20th-century.

The studies of "inner space" and "outer space" have become especially synergistic during modern times. *From Quarks to the Cosmos* is a review of the progress made in both areas during the 20th-century, with emphasis on the instruments (the "Tools of Discovery") and on how discoveries made in one area have influenced the other. The authors are expert contributors to their respective disciplines of experimental elementary-particle physics and theoretical astrophysics. Like the others in the Scientific American Library Series, the book is clearly written and readable by a well-educated layman. Nearly every page contains appropriate color photos or diagrams. Especially intriguing are the photographs of an impressive variety of modern instruments, collected here in one place — multiple-mirror telescopes, a three-story-high "collider detector", the Hubble Space Telescope in pre-launch storage, underground observatories that search only for exotic particles from space, and a section of the SSC under construction at Brookhaven.

The most profound coalescence between studies of inner space and outer space has occurred in "Big Bang" cosmology, the study of the explosive origin of the Universe. The convincing evidence that the Big Bang was the correct metaphor for the universe came in a discovery of microwave noise from space in the 1960s; as in the SN1987A case, the discovery was made serendipitously, with an instrument designed for other purposes and while looking for something else. Investigation of the Big Bang calls for looking deeper into space, and is part of the justification for the Hubble Space Telescope. Understanding its very earliest stages requires reasoning from the most fundamental knowledge of modern particle physics, so the Big Bang is also at least part of the reason for building "the machine of the 1990s" — the Superconducting Supercollider (the SSC). *From Quarks to the Cosmos* makes interesting reading, even if one only looks at the pictures and reads their captions. For example, the history of the universe is neatly summarized in an informative, annotated plot of 32 powers of ten in temperature vs. 60 of time. Teachers of science at many levels will find lots of up-to-date information here, too, much of it presented in tabular form. The "standard model" of elementary particles and forces is especially well-presented through tables. This book would be a worthy addition to the teacher's bookshelf and to anyone's coffee table.

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# BOOK REVIEW

**FREE: The End of The Human Condition. By Jeremy Griffith. 1988. Centre For Humanity's Adulthood, Sydney, 2001, Australia. 228 p. $14.00 paper.**

This extraordinary book is divided into three parts. Part I deals with "The Human Condition." What is the "human condition?" It is a condition of divisiveness, the result of human competitiveness, egocentricity and aggressiveness. The thesis of the book is that until we understand how this situation arose, we are powerless to confront or overcome it. Once we do understand how it arose, the human condition, as we know it, will come to an end. How did it arise? The pervasive metaphor of the book is individual maturation. An eight-year-old (representing budding reason) is at a birthday party with seven-year-olds. The eight-year-old decides to take the entire birthday cake for himself. The younger children (obeying instinctual pre-rational desires) criticize him as selfish. The eight-year-old tries another tack. He offers to share some of the cake with the younger children to keep them quiet. They are not fooled. The older boy then tries to rationalize his behavior and, in so doing, comes to think of himself as bad. The conflict between instinct (the criticism of the seven-year-olds) and reason (the eight-year-old's attempt to understand his situation) engenders an unwarranted sense of guilt. The author contends that "[t]he origin of all the human upset on earth was our instinctive self's unjust criticism of our mind's necessary efforts to find understanding." (p. 10) The author then presents a prophetic narrative of the phylogenetic "stages" of human development, which is modelled on the development and stages of individual growth. The sequence goes from "Infantman" (our postulated "Ramapithecus like ape ancestor") through various stages of "Childman" (Australopithecines) to "Sobered Adolescentman" (*H. habilis*), "Adventurous Adolescentman" (*H. erectus*), "Angry Adolescentman" (*H. sapiens*) to "Sophisticated Adolescentman" (*H. sapiens sapiens*). Phylogeny, to turn a phrase, recapitulates ontogeny. Once the truth about the origin of our competitive natures has been revealed, as this book claims to do, human beings will become free to develop the cooperative, integrated social structures it is their destiny to achieve. We are now on the verge of becoming truly adult.

Part Two, "The Unevasive Scientific Story of the Ascent of Humanity," lays out the unvarnished truth concerning the historical development and future course of humanity. The meaning of existence ( = the development of order) and the meaning of life ( = the promotion of love indoctrination) stand revealed. The good news is that "[s]ince all information can now be unevasively related, a much expanded, beautifully ordered and laid out edition of this book will one day be able to be produced and its format will reflect the development of order of matter on earth. In the future there will not be lots of different books, there will be only one, to which we will all contribute. In the future we will not be insecure, confused and egotistical. There will not be variously confused expressions of the truth. Ultimately there is only one truth - one God - not many Gods." (p. 97) The bad news is that we are continually beset by partial truths - from sociobiological analyses of the human conditions to New Age philosophy which, because they are partial, present what the author dismissively calls "evasive" accounts of the place of human beings in nature.

The conclusion, Part Three, consists of a number of strategic remarks on the difficulties of being a true prophet in a world pervaded by false prophets. The book ends with an appeal to the reader to join or support the work of The Centre for Humanity's Adulthood, which published the book. A form for the reader's convenience is printed on the last page.

This is an ambitious and audacious book. The author's ambition is to present the Truth, the *Whole* Truth and Nothing But The Truth about the Human Condition. The author's audacity consists in his conviction that he, and he alone, has succeeded.

This is not a book of scholarship. It presents neither evidence nor arguments (although such are claimed to be forthcoming in the fuller version of which the present work is only the summary). It is a prophetic narrative. Biblical quotations appear with regularity. The author's aim, however, is not the promotion of some version of Christianity as such. Rather, he has a vision of compassionate human beings living in peace and harmony in a world without conflict. This is a noble vision, but it is not clear either how it is to be realized or that it is, as the author asserts, the necessary end of human evolution. Even if the author's historical scenario about the origin of human conflict and misery were correct, there is no reason to think that the mere knowledge of this will lead to the resolution of all conflict.

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